

IRRIGATION OF WAR WOUNDS: Wound Debridement, Washout and Irrigation

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<input checked="" type="checkbox"/> Minor Changes (or)	<input type="checkbox"/> Changes are substantial and require a thorough reading of this CPG (or)		
<input type="checkbox"/> Significant Changes			

1. Goal: To review indications for and the procedures associated with battle related wound debridement, washout, and irrigation.

2. Background. Wound debridement, washout and irrigation are the surgical procedures most performed in the combat theater. Given the power of today's munitions, prompt removal of devitalized tissue, debris, blood and bacteria is imperative not only to prevent local wound complications, but also may decrease the incidence of systemic effects associated with such wounds. **While the degree of initial debridement is left to the operating surgeon, care must be given to ensuring all devitalized tissue is removed while at the same time attempting to preserve as much soft tissue as possible for reconstructive surgery at higher echelons of care. This is best accomplished via serial debridement and washouts.** Though high pressure pulsatile lavage devices (HPPL) are used extensively in civilian institutions, they should not be used in the combat theater as they may contribute to increased tissue damage and result in a rebound increase in bacterial load, as opposed to that seen with the simple bulb syringe method of washout and irrigation.¹

3. Evaluation and Treatment.

- a. **Devices:** **Simple bulb irrigation or gravity irrigation is the preferred method for wound washout and irrigation.** In addition, the bulb and syringe method is more widely available and is significantly less expensive. Large bore gravity-run tubing is the suggested choice for a quick method of irrigation, since it accepts two bags at once, yet still gentle in nature. Example of the large bore tubing is Baxter's Y-Type TUR Irrigation Set, used for urologic cystoscopy, 2C4005, Deerfield, IL: NSN 3218654401; UI 20/case.
- b. **Fluids:** Current research demonstrates that normal saline, sterile water and potable tap water have similar usefulness, efficacy and safety. Sterile isotonic solutions are readily available and remain the fluid of choice for washout and irrigation. If unavailable, sterile water or potable tap water can be used.²
- c. **Volume:** Bacterial loads drop logarithmically with increasing volumes of 1, 3, 6, and 9 liters of irrigation. Sufficient volumes should be utilized to remove all visible debris. The current recommendations are as follows: 1-3 liters for small volume wounds, 4-8 liters for moderate wounds, and 9 or more liters for large wounds or wounds with evidence of heavy contamination.

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- d. Timing of debridement and irrigation: Early wound irrigation facilitates the ability to decrease bacterial load.³ Wounds should undergo debridement and irrigation as soon as feasible after life threatening injury. **Depending on the nature of the wound and the degree of contamination, all battle-related wounds should be washed out at least once every 48 hours.** Obviously, those wounds with more significant contamination will require more frequent washouts, and strong consideration should be given to performing a washout in the period just prior to aeromedical evacuation.
- e. Closure: **Though no hard and fast rules exist for the closure of battle injuries, experience over the last seven years indicates that if the wound was caused by some form of munitions or battle-related trauma, it should initially be left open and allowed to heal by secondary intention or undergo delayed primary closure after several evaluations.**

4. Responsibilities: It is the trauma team leader's responsibility to ensure compliance with CPG adherence.

5. References:

¹ Svoboda SJ, Bice TG, Gooden HA, et al. Comparison of bulb syringe and pulsed lavage irrigation with use of bioluminescent musculoskeletal wound model. J Bone Joint Surg Am 2006; 88(10): 2167-74

² Owens, BD, White DW, Wenke JC. Comparison of irrigation solutions and devices in a contaminated musculoskeletal wound survival model. J Bone Joint Surg Am 2009; 91 (1): 92-8.

³ Owens, BD, Wenke JC. Early wound irrigation improves the ability to remove bacteria. J Bone Joint Surg Am 2007; 89 (8); 1723-6

⁴ *Emergency War Surgery Handbook*, 3rd US Revision, 2004.

Approved by CENTCOM JTTS Director, JTS Director
and Deputy Director and CENTCOM SG